Ice Arena Survey

Fenton W. Chester Rink

145 College Road, Lyndon Center, Vermont

September 2023

FRIAR
architecture
interior design
master planning

ice rinks
athletic facilites
BEAR MOUNTAIN DESIGN

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Section 1 : Introduction

1

Introduction

Background

Friar Architecture Inc. was engaged by Town of Lyndon to provide follow-up architectural and engineering services focusing on the condition of the rink for the Fenton Chester Arena at 145 College Road, Lyndon Center, VT.

Purpose of this Study

The purpose of this facility study is to provide client with an understanding of the challenges facing the Town of Lyndon now and in the near future, a comprehensive view of the range of possible options with cost implications, and a means to reach consensus on the best possible solution to those challenges.

The intent of the facility study process is:

- To offer a transparent process to move the community toward consensus
- To present information clearly to decision makers
- To involve interested members of the community in an interactive discussion of the issues
- To record discussions and decisions reached by the community
- To present the final recommendations as foundation for future actions by Town of Lyndon

Building Location Plan

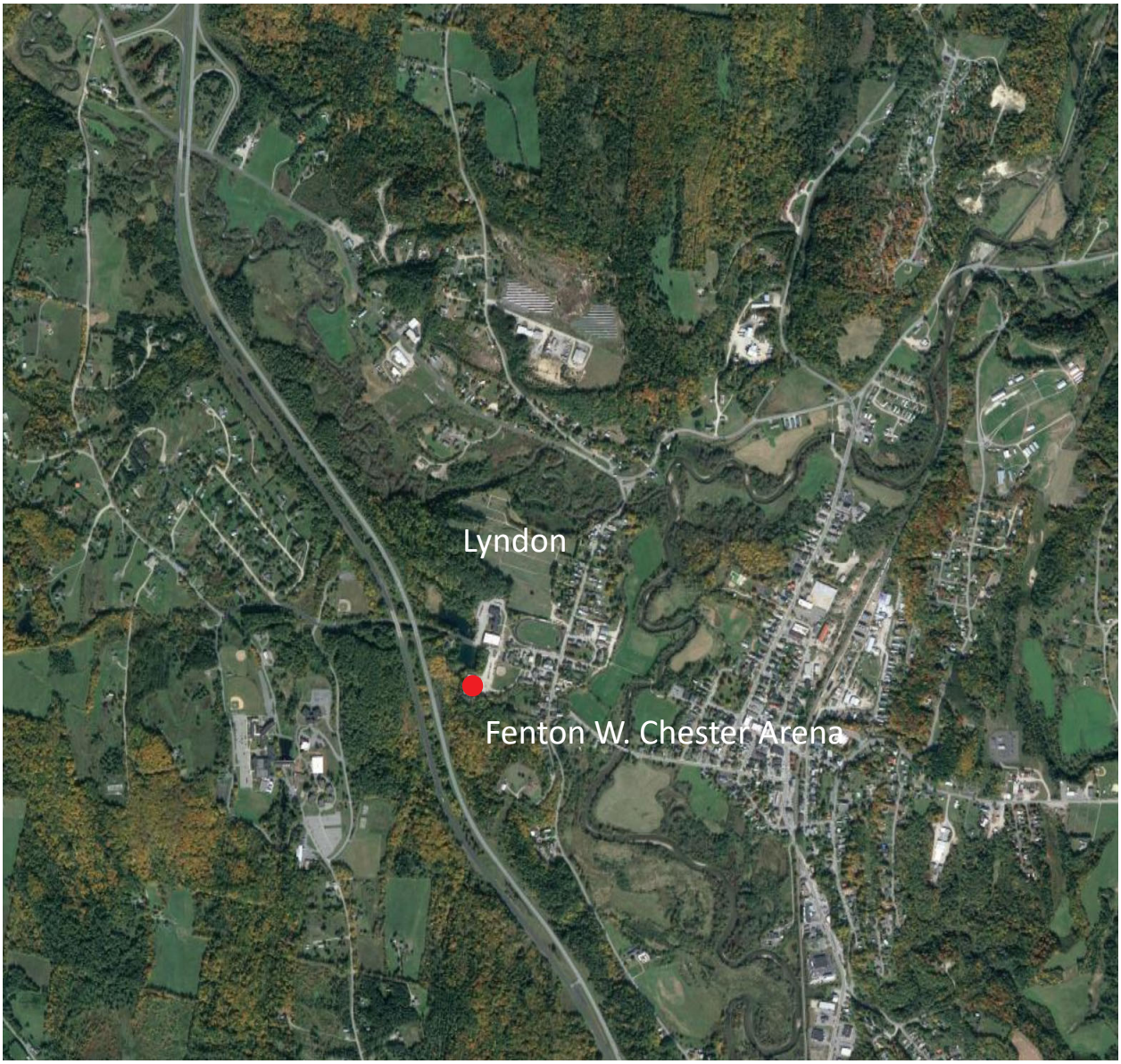
A plan of the area is provided below, identifying the location of the building evaluated under this facility survey.

N

Map Data: Google

Context Map

The map below identifies the location of Fenton W. Chester Rink within the context of Lyndon Center, Vermont.



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Map Data: Google

Section 2 : Executive Summary

2

Building Information

This section contains the executive summary, which provides an overview of the building and summarizes the survey results. Graphs are included to represent current conditions of the building's components and conformity with IBC, NFPA and Accessibility requirements. Photographs of various elevations of the building are provided for reference. This section also provides a summary of the opinion of probable costs, presenting a graphic comparison of the work required to address the deficiencies uncovered during the survey versus the cost of replacing the structure. At the end of Section 2, a chart provides an overview of the required work addressed by the building survey and potential replacement costs.

Fenton W. Chester Rink

Number of Stories	1 story
Area (Square Footage)	22,440 sf
Address	145 College Road, Lyndon Center, Vermont
Original Construction Date	1979
Addition(s) / Renovations	Minor
Building Construction Type	Pre-engineered steel structure on concrete foundation
Existing Program Elements	Ice Arena
Existing Seating Capacity	448
Overall Condition	Good
Description	Fenton Chester Arena is a 1 story ice arena facility serving the hockey community along with public skating.

Building Overview - Photographs

The following is a selection of photographs showing the main exterior elevations of the building. These photographs are keyed by letter on the site plan below. The elevation marks show the location and direction from which the photographs were taken.

Building Overview - Photographs continued...

North Elevation - A

East Elevation - B

Building Overview - Photographs continued...

West Elevation - C

General

Friar Architecture Inc. (FAI) has developed this assessment report and proposed next steps for the Fenton Chester Arena (FCA) in Lyndonville, VT. The report is based on multiple 2023 on-site visits, a review of documents provided by Rink Inc, conversations with several local arena representatives including Andrew McGregor (board member), Tom Eyman (rink manager), Brad Oakes (rink systems tech) and Jeffrey Tirey (retired PE) and final analysis by FAI, KD Associates, DeWolfe Engineering, and the local VT State Fire Marshal.

FCA (Fenton Chester Arena) Better Than Expected

We have discovered that FCA is in much better condition than expected for a facility constructed in 1979 (44 years ago). There are many reasons we have come to this conclusion including the following;

- As Designed, The Steel Building Structure Complies With Current Building Codes
- The Condition Of The Ice Slab Is Excellent With No Excessive Cracks Or Leaks According To Staff, Board Member & Facility Tech (Tom, Andrew & Brad)
- Energy Efficient LED Lighting Has Recently Been Added Throughout
- An Energy Efficient Compressor Head Cooler Has Recently Been Added
- An Energy Efficient Brine Pump Has Recently Been Added
- An Energy Efficient Boiler Has Recently Been Added
- The Dasher Condition And Location On The Ice Slab Are Both Good
- The R22 Ice Making Refrigeration System Is In Good Shape For It's Age And Has No Leaks According To The Rink Tech (Brad)
- Two Small Commercial Dehumidifiers Exist In The Main Arena To Help With Moisture Issues (Although Interior Moisture Issues Still Exist)
- Annual Energy Costs Are Very Competitive Compared To Other VT Rinks
- According To Users The Ice Quality Is Mostly Good (Except At The Unwanted Drip Lines & Ice Buildup in Some Areas Both Due to Condensation Issues)
- The General Rink Accommodations Are Reasonably Competitive
    - -Four Team Rooms
    - -A Full Service Kitchen
    - -Bleacher Seating
    - -A Pro-Shop
    - -A Raised Filming Platform
    - -Rink Managers Office Near Entrance
    - -Men's & Women's Bathrooms Near Entrance
    - -Interior Resurfacer Room
    - -The Facility Has A Balanced Annual Operations Budget
- The Recent Environmental And Fire Marshal Reports Were Mostly Positive

FCA - Continuing Improvement Process

Critical updates have been made to the rink since it was originally built, including several recent improvements listed previously. These updates have been successful in keeping the facility operational and relevant. There are dozens of events and programs hosted for the local community adding an important cultural, athletic and team oriented developmental experience for the thousands of users annually as well as tens of thousands of business dollars into the local business establishments. If FCA is to continue to be successful there will always need to be ongoing updates/improvements. The following is a list of issues and improvements that FAI currently recommends for the rink.

- Repair Existing Deficiencies And Damage To The Main Building Structure As Listed In Report By DeWolfe Engineering Inc. To Ensure That The Building Stays Strong And Safe To Use Into The Future
- Retain A Soils Expert & Civil Engineer To Examine Steep Slope/Drop-Off At Rear Corner Of Building To Ensure Foundation Integrity (Part Of FAI Proposal For Next Steps)
- Increase Building Structure Capacity As Needed For Future Building Expansion Or Improvements (Better Insulated Roof, Solar Panels, Expansions etc)
- Replace The Existing Roofing, Exterior Walls And Exterior Insulation Systems To Eliminate Long Term Maintenance Issues, Reduce Operational Energy Costs And Eliminate Interior Moisture Issues
- Modernize The Building Layout To Achieve A Better, Safer, More Modern, Efficient User Friendly Facility
- Add Spaces As Needed Across The Rear Of The Building To Gain Needed Space And To Shore-Up Rear Building Structure
- Dangerous And Destructive Existing Ice Buildup (Dams) At Roof Eaves Needs To Be Addressed
- Condensation Moisture Eroding Building Structure And Creating Bumps On Ice And Infiltrating Insulation Systems, Electrical Systems And Essentially Everything Inside The Building Need To Be Addressed
    - -Dangerous Ice Buildup Above Main Building Access Points
    - -Dangerous Ice Buildup Around Dashers & Gates
    - -Dangerous Ice Formation On Everything In Back Right Corner Of Main Rink
    - -Sliding Ice & Snow Issues At Sloped Roof Vents, Boiler Exhaust & Commercial Hood
    - -The Existing Bagged Interior Ceiling Insulation Is Full Of Moisture As It Is Not An Ideal For Ice Rinks
- There Are No Fresh Air Systems In The Entire Building Which Needs To Be Addressed For Improved Occupant Health
- Improve Interior Dehumidification System As The Existing System Is Completely Insufficient To Handle The Rink Moisture Loads
- Add Bathroom Facilities As The Two Existing Bathrooms Are Not Sufficient At Times
- Modernize And Add Team Rooms To Be More Competitive With Other VT Rinks
- The Existing Players Bench Area Has Clearance Issues Which Need To Be Addressed
- The Existing Make-Shift Wood Structured Add-Ons Should Be Improved For Health And Safety Reasons
- The Independent List Of Projects From The Rink Tech Should Be Addressed
- Remaining Pertinent Items From Dan French's June 2020 List Of Recommendations Should Be Considered For Completion
- Modernize And Improve Site-Lines For Bleachers To Make Them Safer And More User Friendly
- Existing Resurfacer Room Headroom, Accesses, Layout And Accommodations Are Problematic And Need To Be Addressed
- Existing General Storage In Building Could Be Better Organized And Additional Storage Space Would Be Helpful
- All Existing Public Rooms/Spaces Need To Be Modernized To Make Them More Competitive With Other VT Rinks
- Follow Suggestions Included In Environmental Report By KD Associates
- Provide A Facility Service Schedule For The Rink As None Currently Exists Which Makes It Difficult To Properly Manage Deferred Maintenance, Regular Equipment Service Intervals And Long Term Facility Maintenance Budgeting.

Conclusion

Despite being in better than expected condition for the age of the facility it really needs quite a bit of work in order for it to continue serving the community moving forward. The best path to go forward is via the development of a well-integrated, responsive, and economical building renovation via a thorough and methodical schematic design and facilities master planning process. This is what FAI recommends for the Fenton Chester Arena. Clearly the Fenton Chester Arena has a really good base to build upon assuming that the solutions to the top priority improvements can be addressed affordably. Once that is done then the rest of the facility could be modernized in phases over time as construction funds become available. FAI will provide a detailed proposal for these services in a separate document.

Important supporting documents are found within the text of this report under separate sections including the following.

- FAI Initial Report Of Base Project Information Dated January 24, 2023
- Rink Use Data Report Dated May 23, 2022
- KD Associates Environmental/Hazmat Report Dated June 12, 2023
- DeWolfe Engineering Associates Inc. Structural Report Dated July 27, 2023
- VT State Fire Marshal's May 30, 2023 Walk-thru Report

Survey Results

Each of the elements that were reviewed under this assessment was ranked on a scale of 1-4, with a 4 rating equating to the highest priority. Components that received a ranking of 3 should be considered to be moderate priorities, while rankings of 2 and 1 are considered to be low priorities. The following chart graphically presents the survey results (reference Section 4 for a detailed description for each category).

Prioritization of Required Work

- Enclosure
- Roof
- Interior
- Structural
- Mechanical (TBD)
- Electrical (TBD)
- Plumbing (TBD)
- Fire Protection (TBD)
- Lighting
- Fire Alarm (TBD)
- Telecommunications (TBD)
- Security (TBD)
- Main Ice Rink Systems (TBD)
- Site (TBD)

Section 3 : Architectural & Structural Survey

3

Architectural Existing Conditions

This section provides a listing of existing conditions of the various architectural and structural components of the building, followed by summary descriptions.

Fenton W. Chester Rink

Plan Drawings	Existing Plans
Photos	Per Friar survey January 2023
Date Built	1979
Architect	Unknown
Date(s) Additions / Renovations	Minor
Construction Type	2B
Type of Occupancy	A3
Number of Stories	1 story
Gross Square Feet*	22,440 sf

* Gross Square Footage defined as: The sum of all areas on all floors of a building included within the outside faces of its exterior walls, including all vertical penetration areas, for circulation and shaft areas that connect one floor to another.

Architectural Conditions - Enclosure (continued)

Rink Name, Address & Key People

Fenton Chester Arena (FCA)
145 College Road
Lyndonville, VT 05850
Tele; 802-626-9361
Tom Eyman - General Manager (on-site rink manager)
Andrew McGregor - Board Member (non-profit FCA management org.)
Town of Lyndonville – FCA Owner
Brad Oakes – Refrigeration/Mechanical Systems Technician

Original Rink Construction Date; 1979

Base Building

Original Base Building Size; 220'x120' (rounded)
Pre-Engineered Armco Steel Structure on Concrete Foundation
Original Contractor; Yankee Builders Inc.
Ice Sheet / Main Rink Area / Ice Support Systems
Size; 200'x85'

Construction; Conc Slab/Cooling Pipes/Heating Pipes
- Ice Quality Seems Good Except for Condensation Drips
- Original Slab Condition; Good

Refrigeration; 1979 Bohn 2-Compressor Indirect R22 Skid with Glychol (brine)
- No R22 or Glycol Leaks (per tech)
- Exposed Header Trench Covered with Wood Planks

Bad Icing Occurring on op of Wood Planks

New VFD Brine Pump via EFF-VT
- New Head Cooler via Eff-VT
- Mid-Life Switched from Water to Air Cooled Chiller
- Mechanical Condition; Functional

Resurfacer; Propane Unit Dropping 130 degree Water (no water treatment)
- Dump Water/Building Boiler – New Oil Fired Buderus (Logano G215)

Dumping of Shavings Outside (on gravel)
- Exit for Dumping Under Raised Eve Line (dangerous and sloppy)
- Resurfacer Room; Ceiling Ht Issues / HW Unit Heater

Dashers; Posted/6 yrs in facility (brought in used) / Rest 100% on Ice Slab
Bad Icing Occurring Along Floor at Outside Face of Dashers
Especially Bad Icing Occurring at Resurfacer Gate.

Team Benches/Penalty Box; Too Narrow with Poor Access

Architectural Conditions - Enclosure (continued)

Roof/Ceiling; (bad moisture issues & heat loss)
- 2-Layers Interior Insulation
  - Original Bagged Insulation Base Layer
  - Hung VB with Blown Insulation Above

Lighting; New LED via Eff-VT

Dehumidification; Arid-Dry M2600 Desiccant (2 fairly new ceiling units)

Fresh Air - None

Ice Painting; In-House

Team Rooms
- 2-Medium Size
- 2-Small Size
- Fresh Air - None
- Unit Heater; Off Hot Water Loop from Boiler
- No Adjoining Bathrooms
- Lighting; New LED Via Eff-VT

Bathrooms
- 1-Men & 1-Women or Entire Facility
- HC Accessible Entrance etc????
- Fresh Air - None
- Unit Heater; Off Hot Water Loop from Boiler
- Lighting; New LED Via Eff-VT

Main Office
- Well Located but Extremely Small

Old Ticket Room
- Now is a Storage Room

Pro Shop
- Skate Sharpening
- Skate Rentals
- Equipment Rent/Purchase
- Fresh Air - None
- Unit Heater; Wall Hung Propane Air to Air
- Lighting; New LED Via Eff-VT

Food Service – Kitchen – Warming Space
- Well Sized and Outfitted
- Commercial Hood – Functional for Grilled Foods (excellent)
  - Poor Location of Exhaust Hood at Eve (Snow & Ice Issues)
- Kitchen Equipment; Propane Fueled
- Seating & Eating Area (large table)
- Fresh Air - None
- Unit Heater; Off Hot Water Loop from Boiler
- Lighting; New LED Via Eff-VT

Architectural Conditions - Enclosure (continued)

Viewing Platform
- Raised with Wooden Stair Access
- Code Issues?
- Fresh Air - None
- Heated By an Electric Space Heater
- Lighting; New LED Via Eff-VT

Miscellaneous Support Spaces (mentioned previously)
- Resurfacer Room
- Boiler Room
- Refrigeration Room

Structural Existing Conditions

The following is a data summary of the structural conditions that were observed and noted during the survey. This information was gathered by a field survey, reviewing the existing drawings and discussions with various building personnel.

DeWolfe ENGINEERING ASSOCIATES
PROFESSIONAL CORPORATION

July 27, 2023

Harold W. Mayhew, RA AIA
Bear Mountain Design
21 Talcott Notch Road
Farmington, CT 06032

Reference: Structural Assessment of Fenton W. Chester Rink
145 College Road, Lyndon Center, Vermont

Dear Harold,

As requested, on May 23rd, 2023, Jillian Fortunati, EI and I visited the above referenced building to complete a structural assessment of the existing building framing. The purpose of the assessment was to determine the live load and lateral load capacity of the existing building as well as the load capacity of the existing foundation with and without the existing under-slab tie rods. It is our understanding that the proposed future plans for the structure include the possible addition of solar panels, structural insulated panels, and snow guards.

In an effort to make our site visit as productive as possible, on May 10, 2023, we provided a sketch of the locations where we wished for the existing building finishes to be removed. On the day of the site visit, most of the requested framing had been exposed for assessment. The assessment was limited to areas where the framing was exposed and finishes were removed, and as such this structural assessment should not be considered an exhaustive review of the structure. There may still be isolated conditions that are structurally significant that were not reviewed. Overall the structural components that were reviewed appeared to be in average to above average condition. No indications of moisture damage existed in the reviewed frame other than some baseplate rust near the Zamboni entrance. As with any structure of this age, there were portions of the structure that require remediation.

The building is a pre-engineered ice/indoor sports arena. The building is approximately 120'-0" wide by 222'-8" long. The roof structure consists of 12 pre-engineered structural steel frames, including the two gable frames, lean to frames, and main frames spaced at approximately 20'- 0" ± on center (O.C.) The frames are approximately 100'-0" wide with the lean-to frame extending an extra 20'-0" ±. Each frame is roughly 31'-0" ± in height from the top of slab to the top flange of the beam, the eave toward the entrance of the building is roughly 7'-0" ± from finish grade and the eave toward the backside of the building is roughly 13'6" ± from finish grade. Spanning between the frames are continuous z-purlins typically spaced at 5'-0" O.C. The spacing of the purlins at the ridge and eave vary but are spaced closer than 5'-0" O.C. The existing frames are shown on the attached sketch SSK-1. The general layout of frame torsional bracing is also indicated on the sketch. Unlike many pre-engineered frames we review, it appears that all of the torsional braces are intact and are in good condition.

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Structural Existing Conditions (continued)

Harold W. Mayhew, RA AIA

Throughout the structure there are several rod braces that are intended to provide lateral bracing of the structure when the building is subject to wind or seismic loading. The brace locations are shown on the attached sketch SSK-2. Based upon the visual inspection and subsequent analysis it appears that many of the lateral braces have been moved and/or are damaged.

The walls of the structure are constructed of metal panels supported on 8" Z girts. The Z girts vary in elevation but are indicated in the sections on Sheet SSK-1. Overall the Z-girts appear to be in good condition.

The main floor area consists of a concrete slab. Each frame is supported by a reinforced pier and the piers appear to be in average to above average condition. There are no apparent signs of movement of the foundation for the majority of the structure. There does appear to be some minor settlement occurring at the southwest corner of the foundation. According to the original construction documents (Foundation Plan S.1 and Foundation Details S.2), the footings vary in size around the building. The original footing sizes (per the original drawings) are also shown in SSK-2. According to the original drawings the current foundation system utilizes an under slab #11 bar tie to prevent the foundations from spreading apart under the significant lateral forces caused by the frame. There are no visual indications that the under-slab bars have degraded but it is very common to find significant damage to the under-slab ties in a hockey arena due to moisture collected under the ice slab. Therefore, in our analysis, we considered both a functioning under-slab tie and a failed under slab tie.

Our analysis is based upon accepted structural engineering standards and upon the requirements of the 2015 Vermont Fire and Building Safety Code which references the 2015 International Building Code (IBC 2015). The flat roof design snow load used in our analysis was 46.2 pounds per square foot (psf) which is based on a ground snow load of 60 psf for Lyndon, VT. This has been factored to consider the importance of the structure, roof exposure, thermal conditions and unbalanced load cases. The dead load of the existing roof structure has been estimated at 5psf. The design windspeed for the building is 120 miles per hour (ultimate) and the seismic design category is C.

During the time of original design and construction, the accepted building code was the BOCA National Building Code, which was an earlier code that tends to be less restrictive for lateral loads. According to the current code, the building can be analyzed for the code at the time of construction unless the structure will be modified by the renovation. Portions that are modified need to meet the current code. There are allowances in the current building code to allow reroofing of the building and allow for installation of solar arrays. The allowances include a maximum increase in load of 5% of the buildings current design load. The BOCA flat roof design snow load at the time of construction was 48.3 psf. The design windspeed was 70 miles per hour (allowable stress) and the seismic performance category was C.

Our analysis of the main frames, gable frames, and porch frames indicates that the original design of the structure was most likely for a snow load of 42 psf. This snow load was slightly lower than the originally required snow load. The 42 psf snow load capacity is consistent with a structure that is not designed as an assembly facility but rather is design as a BOCA type 1 building or occupancy of less than 300 people. The designation of assembly occurs when a facility has the capacity to congregate more than 300 people at a time. Wind load and lateral load capacities are consistent with the BOCA required load cases.

Based upon our analysis of the structure, it is our professional opinion that the building can be occupied based upon compliance with the code at the time of construction. In addition, a load up to 2.35 psf may be added to the roof structure without significant modification of the structural components. If modification to the roof such as the addition of solar panels or the addition of a heavier roof system is planned significant modification of the roof system will be required. Since the majority of the structural components are designed almost exactly to the 42 psf snow load, the majority of the structural components would require reinforcement if the added roof load exceeds 2.35 psf.

Structural Existing Conditions (continued)

Harold W. Mayhew, RA AIA
July 27, 2023

During our inspection it was noted that in a few places the lateral bracing had been either damaged due to a high wind event or removed. These areas included, between gridlines 6 and 7 at the center of the roof the braces were missing, between gridlines 10 and 11 at the eastern wall the vertical lateral braces were missing and between gridlines 10 and 11 braces were bent, it is recommended that new lateral braces be installed in these areas and any other places where braces are bent. It was also noted that several of the rod braces had slipped out of their hillside washers. All of the rod braces should be adjusted and their hillside washers should be reseated.

The CMU bearing wall located at the southeast side of the building at locker room D did not have proper bearing at the location where the z-purlins were supported on the CMU wall. In these locations it appeared that the z-purlins had rotated or the CMU wall had been damaged. We recommend that repair include the installation of bearing plates and recommend that the top of the CMU walls be repaired/replaced.

At the columns at frames 2 and 3 near the east side of the building, the baseplates and anchor bolts were showing sign of corrosion, it is recommended that these baseplates and anchor bolts be sandblasted or wire brushed to bare metal and treated with zinc rich compound. If after sand blasting significant loss of section is apparent, the baseplates should be reinforced.

During the inspection of the foundation, there were various minor cracks in the concrete around the exterior of the building. Along the foundation at the southeast side of the building there were a few exposed form ties, indicating that originally that area of the foundation was below grade. The majority of the cracks in the wall appear to be shrinkage cracks that occur when control joints are not provided in the wall. It appears that the majority of the cracks are not structurally significant. In the areas where form ties have been exposed, we recommend that the exterior grade be raised to prevent the penetration of frost below the footing.

Along the west and south sides of the exterior was a steep bank with a brook running at the base of the bank. We recommend that the condition of the bank in this area be monitored as any scouring at the base of the bank could result in further steepening of the bank with the potential to cause slope stability issues under the southern end of the structure.

Although we did not see any signs of under slab rod tie failure, we were requested to determine what measures it would take to replace the under-slab ties to assure that the ties would not fail in the future. Based upon the steepness of the bank along the western and southern portions of the site, many of the common methods used to replace the ties are not available. We have provided a replacement footing detail on sheet SSK-1 that shows a potential solution to the failure of one or more of the under-slab ties. The replacement of the under-slab ties would be a significant undertaking and is not recommended unless further investigation proves that the ties are compromised.

We understand the Owner is considering several modifications to the building in the future. These potential modifications include a locker room addition to the west, a dormer to the east to prevent sliding snow from falling on patrons, installation of a solar array on the roof, replacement of the roof and/or walls with an insulated metal panel system, and replacement of the antiquated refrigeration system. Each of these potential additions provide challenges and opportunities as follows:

- Locker room addition to the west:
  - Steep bank slopes to the west will limit the possible locations where locker rooms can be constructed without significant soil stabilization work.
  - Installation of the locker rooms would likely allow for a simpler reinforcement scheme if the underslab ties are determined to be in unacceptable condition.
- Eastern dormer:
  - Installation of a dormer will increase loads on the roof beyond the capacity of the existing purlins, frames, and potentially overstress the existing underslab ties. This option will require significant reinforcements throughout the structure.

Structural Existing Conditions (continued)

  - This option would significantly increase safe access and egress for the patrons. An option that could increase patron safety while limiting reinforcement requirements may include the addition of a flat roof foyer or entry structure.
- Solar array installation:
  - The addition of a direct applied roof mounted solar system usually results in a 2.0 psf to 3 psf additional roof load. As indicated above the capacity of the roof for the addition of solar panels is 2.35 psf without requiring reinforcement of the roof. As such we suggest that if panels are considered, the solar panel manufacturer consider limiting the number of panels to meet the allowable load criteria.
- Replacement of the roof and wall panels with insulated metal panels:
  - The existing roof structure load was estimated to be 5.0 psf. It is likely that new metal panels could be installed without roof reinforcement if the existing roof and existing insulation system is removed to the purlins and replaced. If the new panels will be placed over the existing roofing it is likely that the entire structure will require reinforcement.
  - Wall panel replacement can be completed without significant structural ramifications.
- Replacement of the antiquated refrigeration system:
  - To replace the existing refrigeration system, significant slab work and mechanical work will be required. It is likely that the slab work will interrupt the existing underslab ties and at that time the ties will either need to be replaced or the foundations improved to resist the lateral forces.

If you have any questions concerning this report or our findings, or would like more detailed sketches of the recommended repairs in this report, please call or write.

Sincerely,

Christopher J. Temple, P.E.

Structural Existing Conditions (continued)

Figure 1 - Corrosion at Base Plate of Column by Overhead Door

Figure 2- Corrosion at Base of Gable Column by Overhead Door

Structural Existing Conditions (continued)

Figure 3 – Bearing of Purlins at CMU wall above Locker Room D

Figure 4 – Bearing of Purlins at CMU wall above Locker Room D

Structural Existing Conditions (continued)

Harold W. Mayhew, RA AIA
July 27, 2023

Figure 5 - Cracks in foundation at exterior

Structural Existing Conditions (continued)

Figure 6 - Cracks in foundation at exterior

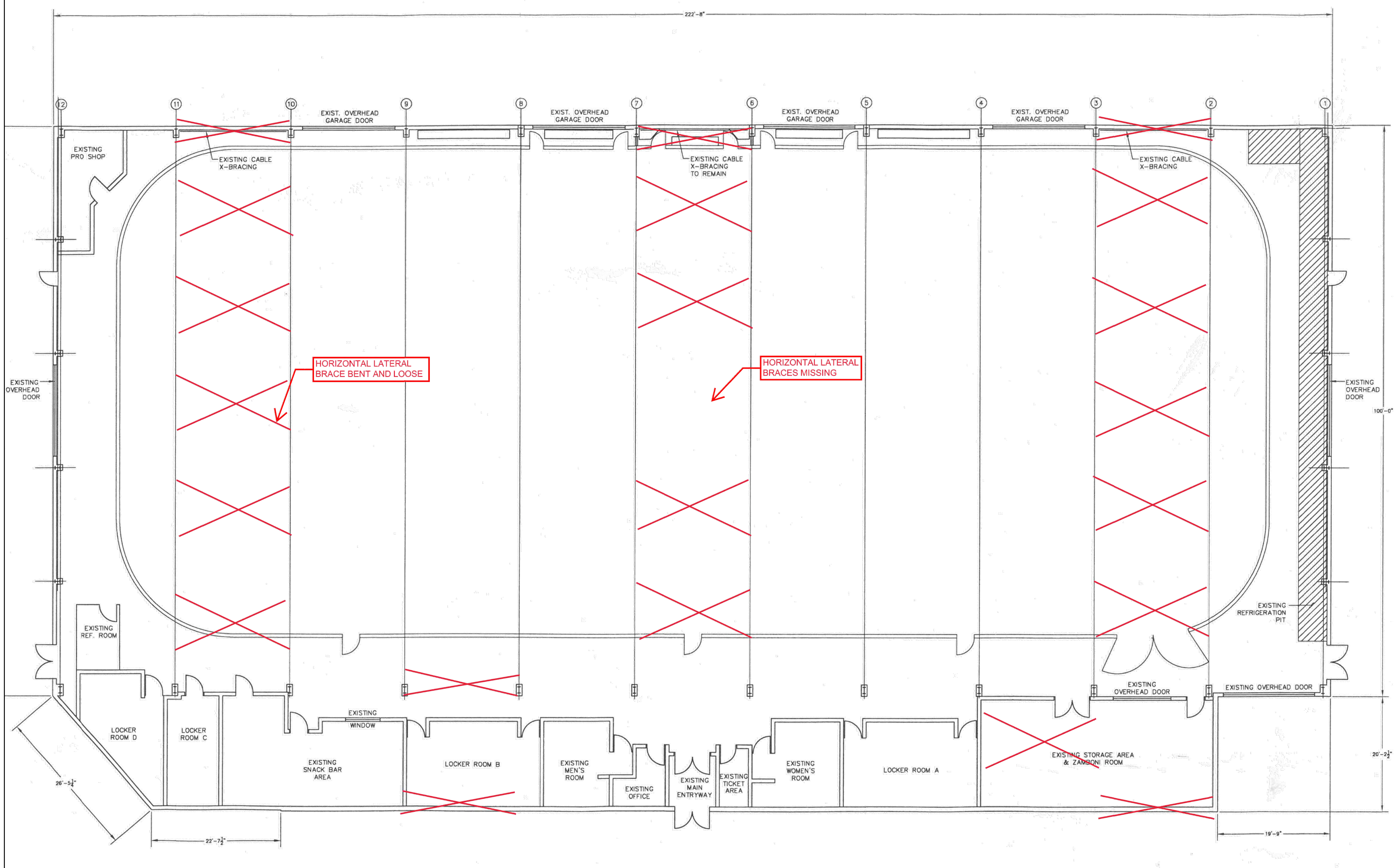
Figure 7- Steep embankment along south and west around exterior

Existing Structural Plans

The following plans show the existing structural bracing summary, existing gable and main framing, existing foundation details and plan.

Fenton W. Chester Rink

Lateral Bracing Summary



EXISTING FLOOR PLAN

PROJECT NORTH — SCALE: 1/8"=1'-0"

Civil & Structural Engineers
DeWolfe
ENGINEERING ASSOCIATES
PROFESSIONAL CORPORATION
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no.	date	revision
△		

project name: FENTON W. CHESTER RINK

project location: LYNDON VERMONT

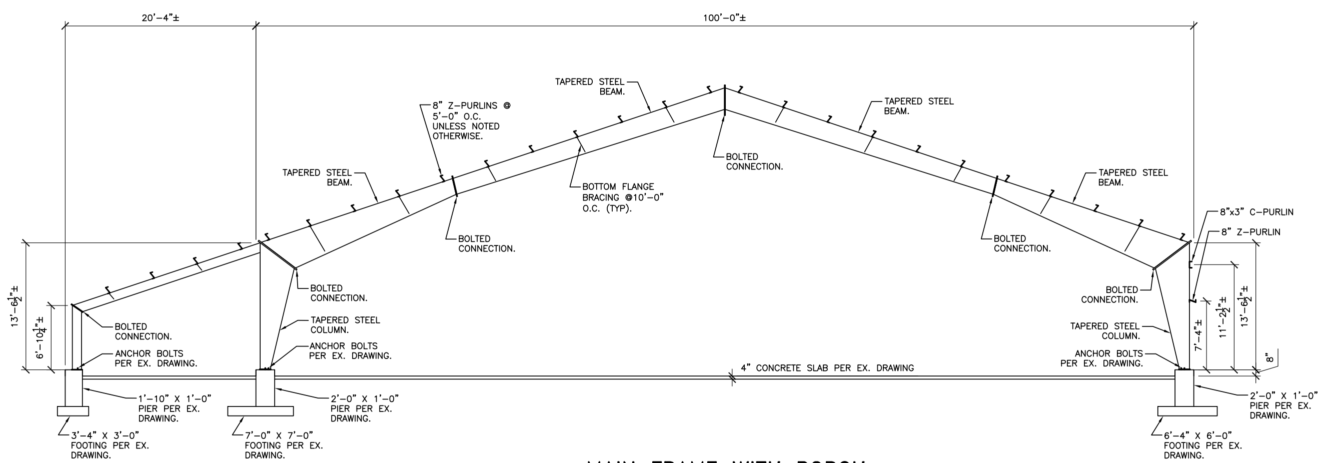
client: HAROLD W. MAYHEW

project number: 23020
drawn by: JMF
checked by: CJT
scale: AS NOTED
date: 18 JULY, 2023
released for:

sheet description: LATERAL BRACING SUMMARY

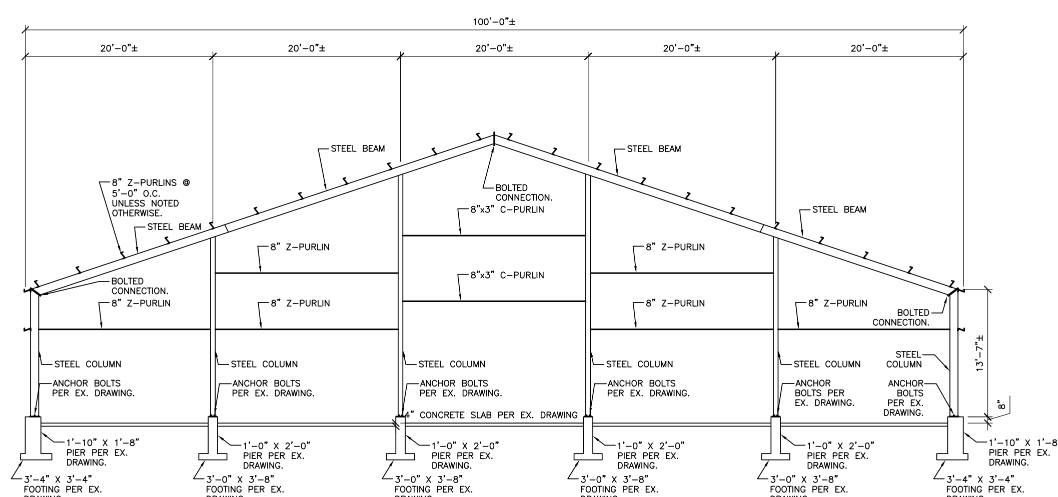
SSK-2

FRIAR



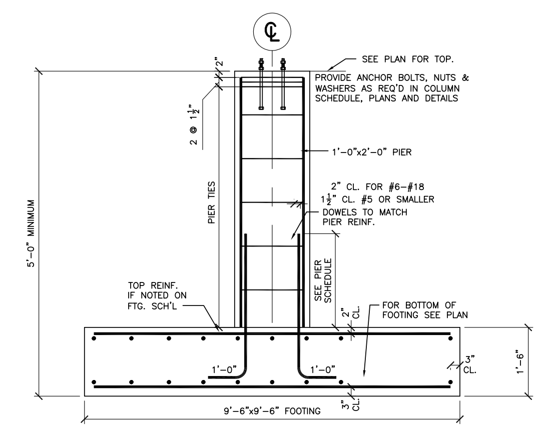
MAIN FRAME WITH PORCH

SCALE: 1/8"=1'-0"



GABLE END FRAME

SCALE: 1/8"=1'-0"



SCHEMATIC PIER AND FOOTING SECTION

SCALE: 1/2"=1'-0"

Civil & Structural Engineers
DeWolfe
ENGINEERING ASSOCIATES
PROFESSIONAL CORPORATION
t. 802-223-4727 f. 802-223-4740 www.dirtsteel.com
317 River St., P.O. Box 1576, Montpelier, VT 05601-1576

no.	date	revision
△		

project name:
FENTON W. CHESTER RINK

project location:
LYNDON
VERMONT

client:
HAROLD W. MAYHEW

project number:	23020
drawn by:	JMF
checked by:	CJT
scale:	AS NOTED
date:	18 JULY, 2023
released for:	

sheet description:
EX. GABLE AND MAIN FRAMES

SSK-1

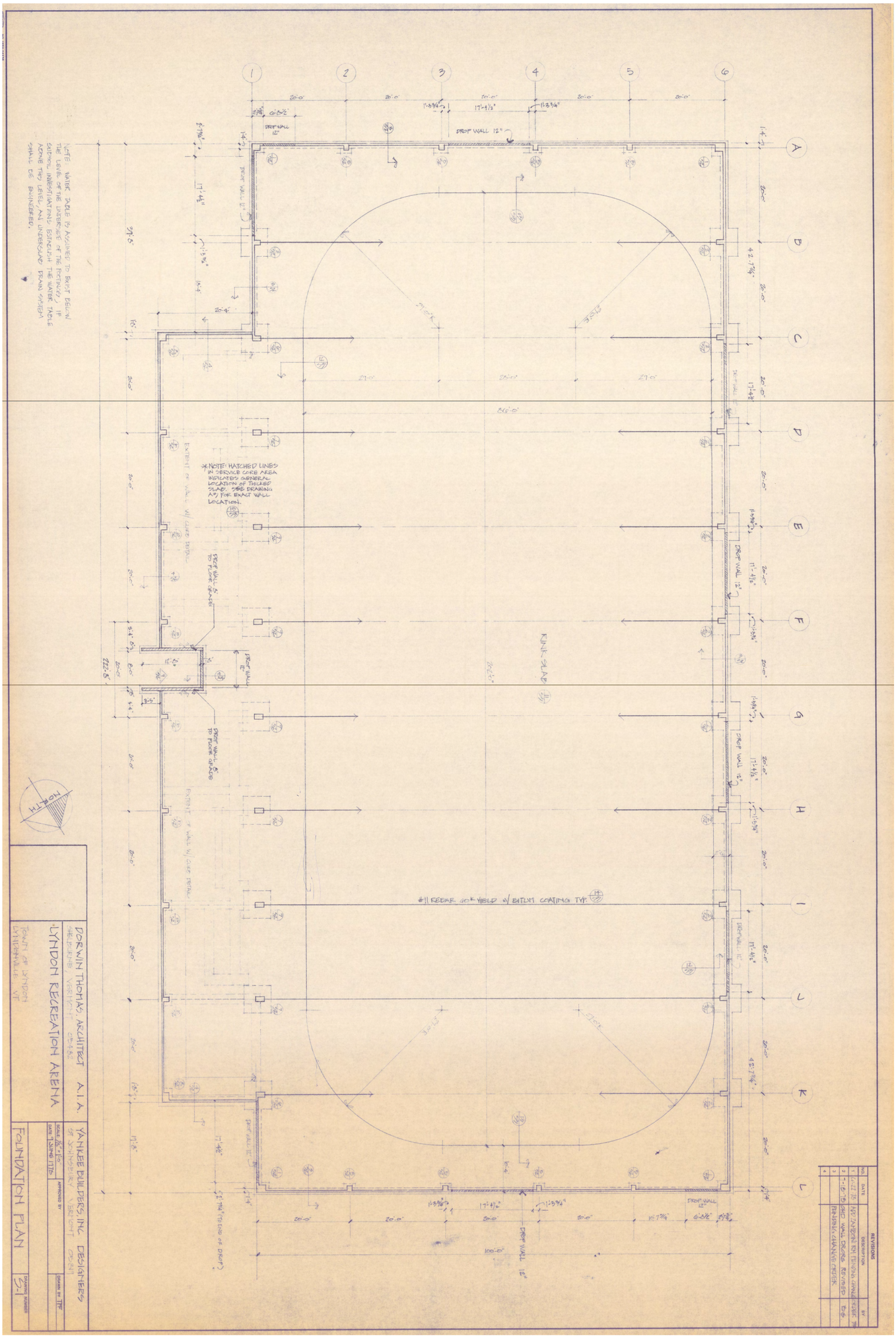
Fenton W. Chester Rink

Existing Gable and Main Frames

Arch/Struc Survey

FRIAR

1 S1 ENDWALL CORNER DETAIL
SCALE 1/2" = 1'-0"
2 S1 SIDEWALL PIER DETAIL
SCALE 1/2" = 1'-0"
3 S1 TYP FROSTWALL
SCALE 1/2" = 1'-0"
4 S1 FROSTWALL @ SERVICE CORE
SCALE 1/2" = 1'-0"
5 S1 ENDWALL PIER DETAIL
SCALE 1/2" = 1'-0"
6 S1 INSIDE CORNER DETAIL
SCALE 1/2" = 1'-0"
7 S1 INTERIOR PIER DETAIL
SCALE 1/2" = 1'-0"
8 S1 CORNER SERVICE CORE
SCALE 1/2" = 1'-0"
9 S1 ELEVATION ENTRY
SCALE 1/2" = 1'-0"
10 S1 SIDEWALL PIER SERVICE CORE
SCALE 1/2" = 1'-0"
DATE SYM REVISION RECORD DR. CK.
DORWIN THOMAS ARCHITECTS
SHELBURNE VERMONT 05482
YANKEE BUILDERS, INC. DESIGNERS
ST JOHNSBURY VERMONT 05819
LYNDON RECREATION ARENA
TOWN OF LYNDON
LYNDONVILLE, VT
SCALE 1/2" = 1'-0"
DATE 6/15/95
APPROVED BY
DRAWN BY TFP
FOUNDATION DETAILS
DRAWING NUMBER S1


NOTE: WATER TABLE IS ASSUMED TO EXIST BELOW THE LEVEL OF THE UNDERSIDE OF THE FOOTINGS. IF EXTERNAL INVESTIGATIONS ESTABLISH THE WATER TABLE ABOVE THIS LEVEL, ALL UNDERSLAB DRAIN SYSTEMS SHALL BE ENGINEERED.
*NOTE: HATCHED LINES IN SERVICE CASE AREA INDICATES GENERAL LOCATION OF THICKER SLAB. SEE DRAWING A1 FOR EXACT WALL LOCATION.
DROP WALL 12"
DROP WALL TO FLOOR GRADE
EXTENT OF WALL W/ CURB BEYOND
RUNT SLAB
#11 REBAR @ 6" YIELD W/ EPOXY COATING TYP.
NORTH
DARWIN THOMAS, ARCHITECT A.I.A.
SHELBURNE, VERMONT 05482
YANKEE BUILDERS, INC. DESIGNERS
OF SCHENECTADY, NEW YORK
LYNDON RECREATION ARENA
TOWN OF LYNDON
LYNDONVILLE, VT.
FOUNDATION PLAN
S-1
SCALE: 1/8"=1'-0"
DATE: 1/30/98 (1/12)
APPROVED BY
DRAWN BY: TPF
DRAWING NUMBER
REVISIONS
NO. DATE DESCRIPTION BY
1 2-27-98 ADD'L NOTES IN ENGINEERING CHANGES SBE
2 3-6-98 DRC WALL DRGNS. REVISED SBE
3
4

Section 4 : Hazardous Materials Assessment

4

Existing Hazardous Material Assessment

12 June 2023

Mr. Hal Mayhew
HWM

Re: Hazardous Materials Assessment – Fenton Chester Arena
145 College Circle, Lyndon Center, Vermont
K-D Project No.

Dear Hal,

At your request, a representative of K-D Associates, Inc. visited the Fenton Chester Arena at 145 College Circle in Lyndon Center, Vermont to conduct a visual assessment for potentially hazardous materials. The assessment was conducted as part of an initial investigation in advance of any renovation of the arena. No sampling or testing of materials was conducted during this phase of the investigation. The assessment focused on asbestos containing building materials, Lead Based Paint (LBP), Polychlorinated Biphenyls (PCB's), process chemicals used in the ice making process, storage of heating fuel, general chemical products used on site, universal wastes, and unusual mold growth, observed during the walk-through of the facility on May 23, 2023.

In general, hazardous materials were identified through observation made on site and information provided by the operators of the rink. To the extent possible, the investigation included access to typically inaccessible areas such as the interior of walls and the roof. For the purposes of this report, assumptions have been made about the consistency of these materials in other areas of the arena.

Lead Based Paint (LBP) – In 1978, the Consumer Product Safety Commission banned the manufacture and use of lead-based paint in residential applications which effectively removed the risk and likelihood that lead based paint would be found in any buildings built after this date. The Fenton Chester Arena was built in 1979, therefore lead based paint is not suspected as a hazard at this facility and additional testing is not recommended.

Asbestos Containing Building Materials (ACBM) – A list of suspect asbestos containing materials was generated during the walk-through. Suspect materials remain so until laboratory analysis shows otherwise. The date of installation may affect the likelihood of the materials containing asbestos but does not provide relief from the Vermont Department of Health and Environmental Protection Agency requirement to have suspect materials tested prior to renovation or demolition activities that would disturb these materials.

The building has a steel structure on a cement slab with metal siding and metal roofing. Insulation at the roof is a combination of blown-in insulation and foam board. Insulation at the walls is fiberglass batting. The following suspect asbestos containing materials were observed:

- Gypsum board and joint compound at various walls and ceilings
- Vinyl baseboard and associated adhesive in various areas
- Sheet vinyl flooring and associated adhesive in bathrooms and other areas

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e-mail: kdai@kdassociatesinc.com • website: www.kdassociatesinc.com

Existing Hazardous Material Assessment (continued)

- 12" by 12" vinyl floor tile and associated adhesive
- Sink undercoating
- Caulking materials at the exterior roof
- Blown-in insulation materials at the ceiling

The interior of the block walls was not readily accessible to determine the possibility of poured insulation materials within the blocks. The small wall openings available did not reveal insulation materials such as vermiculite or perlite.

Once the design and renovation plans are better known, it is recommended that materials potentially affected by the work be tested as part of a comprehensive asbestos assessment.

Polychlorinated Biphenyls (PCB's) – PCB's were commonly used in building materials between 1950 and 1979 when they were banned, although the use of PCB's in materials such as caulking had already been significantly reduced by 1970.

PCB's were added to building materials for a variety of reasons. Materials to which PCBs were added included fluorescent light ballasts (FLB's), exterior caulking materials, paint and other common building materials used in schools. The highest concentrations in school building materials are typically found in the FLB's, older transformers, and sometimes caulking materials. Use of PCB's in paint was more commonly found in specialty paints intended for specific industrial uses.

In general, very few suspect PCB containing building materials were observed. Lights are predominantly light emitting diode (LED) at this time and caulking materials appeared to be minimal. Considering that the Fenton Chester Arena was built in 1979, the presence of PCB containing or contaminated materials is unlikely.

Process Chemicals – The Fenton Chester Arena uses Glycol (R22) as the refrigerant in the ice cooling system. It was reported that the refrigeration system is inspected approximately once a month. Under the Industrial Process Refrigeration, Leak Repair Regulations, Section 608 of the Clean Air Act, refrigerant systems, including Fenton Chester Arena, are subject to various requirements including leak repair requirements. Other Federal and State environmental and safety laws also apply.

R22 is considered a class II refrigerant. The refrigerant recycling rule applies to systems that use a class I or class II refrigerants. The leak repair requirements of this regulation are triggered when an owner or operator of an industrial process refrigeration system normally containing greater than 50 pounds of refrigerant, discovers that the refrigerant is leaking at a rate that would exceed 35 percent of the full charge in a 12-month period. Based upon the description of the current operation of the system at Fenton Chester Arena, there appears to be minimal leakage from this system at this time.

It is important to know that R22 is being phased out and at some time in the future, will not be available. Alternatives are becoming available and you may wish to consider this in any future renovation plans.

General Chemical Products – The rink does not have large amounts of chemical products on site that we observed. There does not, however, appear to be any accounting of the Safety Data Sheets, Hazard Communication Plan or appropriate labeling and storage. In particular, flammable materials appear to be stored in easily accessible areas. Meeting Vermont Occupational Safety and Health Administration (VOSHA) requirements is not currently being met and represents a safety hazard as well as a regulatory and legal liability.

Heating Oil Storage – It was reported that an underground storage tank (UST) is present at the front of the building and used for the storage of #2 fuel oil for on-site heating. The size of the UST was not certain

Existing Hazardous Material Assessment (continued)

but is believed to be less than 1,100 gallons. This would be considered a "Category 4 Underground Storage Tank" under the Vermont UST Rules and would be exempt from reporting requirements and other leak detection/prevention measures.

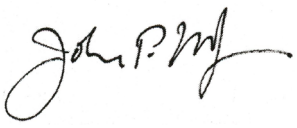
While exempt from a large part of these rules, a leak from a UST containing #2 fuel oil can have significant and costly implications for the potential clean-up of a spill. Without knowing the age or condition of the tank it is difficult to assess the useful life of this tank from an above ground inspection.

Carbon Monoxide (CO) – Ice at the Fenton Chester Arena is regularly resurfaced with propane fueled re-surfacing equipment and a propane fueled edge surfacer. These re-surfacers regularly release combustion products including carbon monoxide (CO) into the arena. Ice rinks rely upon ventilation systems to remove the CO and bring in fresh air. Ice arena operators can take action to reduce the risk of carbon monoxide poisoning including maintaining working carbon monoxide monitors in public areas, warming up fossil-fueled ice re-surfacers in a well-ventilated area, outdoors if at all possible, and monitoring the exposure of re-surfacing operators.

Based upon the described observations and discussion of the potential hazard materials issues, you may wish to consider follow-up investigation of critical areas to include testing and more detailed analysis of existing system. As you progress with the renovation plans, you may also wish to incorporate measures to better accommodate these potential concerns during daily operation of the rink.

Please do not hesitate to call if you have any questions or need additional assistance.

Sincerely,



John P. Madigan

Section 5 : Fire Safety

5

Existing Fire Safety

Vermont Department of Public Safety

DIVISION OF FIRE SAFETY

Office of the State Fire Marshal, State Fire Academy and State Haz-Mat Team

firesafety.vermont.gov

☑ Waterbury Regional Office	☐ Rutland Regional Office	☐ Williston Regional Office	☐ Springfield Regional Office
45 State Drive Waterbury, VT 05671-8200 [phone] 802-479-4434 [fax] 802-479-4446	56 Howe Street, Building A, Suite 200 Rutland, VT 05701-3449 [phone] 802-786-5867 [fax] 802-786-5872	380 Hurricane Lane, Suite 101 Williston, VT 05495-2080 [phone] 802-879-2300 [fax] 802-879-2312	100 Mineral Street, Suite 307 Springfield, VT 05156-3168 [phone] 802-216-0500 [fax] 802-216-0511

FIRE INSPECTION RESULTS

Site Id: 49996

Structure Information

Name:	FENTON CHESTER ICE ARENA	Address:	145 COLLEGE ROAD
Structure Id:	49996		LYNDON CENTER, VT 05850

Owner Information

Owner:	TOWN OF LYNDON (N 6982)	Address:	PO BOX 167
eMail:	lyndon@kingcon.com		119 PARK AVENUE (DANIEL HILL-MUNICIPAL ADMIN)
Phone:	802-626-5834		LYNDONVILLE, VT 05851

Building Description

Risk Index:	M2	Smoke Det:	No	Occupants:	448	Units:	1
Const Type:	2B	CO Detect:	No	Stand Pipe:		Floors:	1
Occ Type:	A3	Fire Alarm:		Sprinkler:		Sq Feet:	22440
Heating:	Oil Hot Water						

Project Description

Name:	Future Exspansion				
Type:	Building Project	Received:	05/24/2023	Workitem Id:	490125

Inspection Detail

Insp Date:	05/24/2023	Insp Type:	Initial	Violations:	
Comply By:		Occ Granted:	Yes	Hazard Index:	Level 1
Inspector:	Timothy Angell (S 95366)				

Violations and Notes

I met on site with Scott Beck to review possible updates and expansion.

Any future fire safety upgrades would be based on the size of the expansion project and total square footage. New building construction would include code compliance incorporating the the IBC and NFPA building code requirements.

As the building site now ADA is acceptable. Any future expansion or renovation will need to include the updating of the ADA standards, particularly building accessibility, ADA bleacher accessibility.

A sprinkler system and fire alarm system may be required.

Any future work would require the use of an architect.

Section 6 : Building Use

6

Existing Building Use

MEMORANDUM

To: Town of Lyndon Selectboard

From: Tom Eyman, General Manager, Fenton Chester Arena

Date: May 23, 2022

Subject: Status Report on 2021-22 Season at Fenton Chester Arena

The Selectboard has requested, and I am pleased to provide this report regarding the results of the 2021-22 season here at the Arena.

As everyone knows, RINK, Inc. was faced with a huge challenge in reviving the ice arena after a full season of sitting dormant, at the beginning of which there were maintenance issues that would require attention before the facility could go back into operation. Fortunately, a successful fundraising effort made it possible to address those issues. The Arena reopened as of November 1, 2022 and enjoyed a very successful season.

The opening was delayed approximately two weeks when it was discovered that the Zamboni required a new engine. Most of that delay was caused by the slow lead time in shipping the engine from the West Coast. Once received, it was installed within two days and was ready for operation as of October 31st.

Just how much this facility means to the people of Lyndon and the NEK was apparent from the smashing success of the on-line fundraising and live auction over the summer, but the point was driven home by the enthusiastic return of skaters. Ice users included three high school teams – Lyndon Institute and St. Johnsbury Academy boys teams and the Kingdom Blades girls team; Lyndon Area Youth Hockey (LAYHA) offered 14U, 12U, two 10U, 8U, mini-mites teams and a learn to skate program totaling 110 youth hockey players altogether (and 20 adult coaches and volunteers); the Caledonia Hockey Club girls learn-to-play hockey program resumed operation; seven adult hockey groups skated weekly involving approximately 120 players; the Fenton Chester Skating School returned to Friday nights and registered over 90 skaters in its first session and over 40 skaters in the second session; and the Arena hosted winter program children from the following area schools: Lyndon Town School, Burke Town School, Miller's Run, Riverside, BMA, Sutton, Glover, Danville, Irasburg, Concord, Waterford, East Burke School, and White Mountain School, as well as the Kingdom East Afterschool program. Finally, three weekly public skating sessions were offered throughout the season from beginning to end, on Sunday and Wednesday afternoons and Friday evenings. We hosted approximately 3500 public skaters total. Sunday afternoon was the most popular session consistently attracting over 100 skaters and usually in the 120s and 130s. Our record breaking session was the last of the season on Sunday, March 6th for which 158 skaters turned out. Our new spotlight system and music was very popular.

Existing Building Use (continued)

In all, the Arena booked 860.5 hours of ice time, from November 1, 2021 to March 6, 2022. Weekly usage ranged from 35 hours during November (before the high school teams' seasons began and before school winter programs) to 62 hours on the last week of January and the February school vacation week. All of this was achieved during a period when Covid caused numerous cancellations, particularly high school games and practices and winter school programs.

I would like to put in a good word for my staff, who worked very hard and competently during the ice season. I consider myself extremely fortunate to have been able to hire this crew in the current economic environment. They were Braedy Beck, Don Welch, Rob Martin and Noah Williams. We received numerous and consistent compliments from ice users about the quality of the ice sheet, many saying that they had never seen the ice so good in the years they have skated here. And we did not have to deprive or delay anyone of their ice time due to ice or mechanical issues. And with a forty-plus year old Zamboni, there were indeed mechanical issues.

As has been done over the last 7 or 8 seasons, the ice was removed in early March and artificial turf installed as of March 21st. The Arena hosted a variety of users from that point through April and into May. Users included Lyndon Institute softball, baseball and girls soccer and lacrosse teams; Caledonia Flood youth soccer, including boys and girls teams at the 10, 12, 14 and 19U age levels; St. Johnsbury Recreation Youth Lacrosse; Kingdom East and Lyndon Youth Baseball teams, a weekly adult soccer league, several soccer goalie clinics, and a weekly youth street hockey group which plans to continue playing into the summer.

We were able to keep the promises made to donors over the summer that fundraising would be used for deferred maintenance so that the Arena could reopen and for capital projects. The Arena operated on its own feet this season. We are projecting that the arena's operating expenses for the year will be completely covered by operational revenues. The Arena is in very good shape to continue operations in 2022-23 and beyond. RINK, Inc.'s IRS Form 990 informational tax return has been filed and is available for public inspection upon request.

Section 7 : Existing Condition Photographs

7

Existing Condition Photographs

1. Location:

Exterior

Description:

Exterior End ARMCO Stamp

2. Location:

Exterior

Description:

Exterior Front

3. Location:

Exterior

Description:

Main Entrance

Existing Condition Photographs (Continued)

4. Location:

Interior

Description:

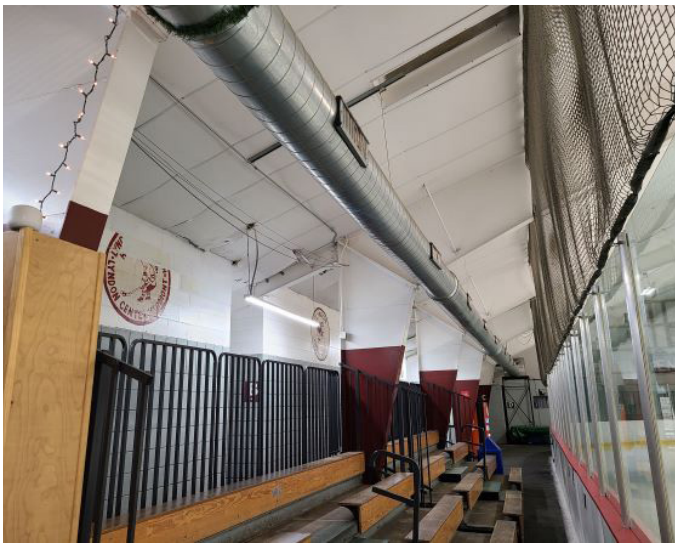
Main Rink 1

5. Location:

Interior

Description:

Main Rink 2



6. Location:

Interior

Description:

Main Rink Side Area 1

Existing Condition Photographs (Continued)

7. Location:

Interior

Description:

Steel bent to concrete FDN @ bracing rod connection 1.

8. Location:

Interior

Description:

Steel bent to concrete FDN 1

9. Location:

Interior

Description:

Steel bent to rear rink wall FDN 1

Existing Condition Photographs (Continued)

10. Location:

Interior

Description:

Boiler

11. Location:

Exterior

Description:

Back side

12. Location:

Exterior

Description:

Condensation ice on dashers.

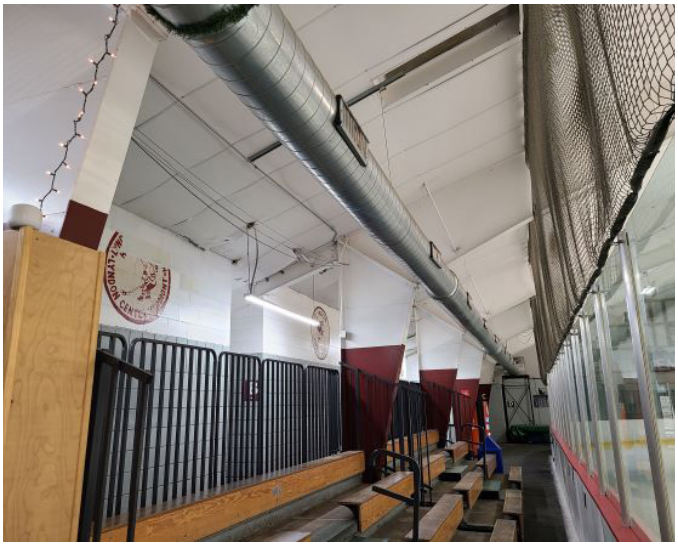
Existing Condition Photographs (Continued)

13. Location:

Interior

Description:

Dehumidifier - rear



14. Location:

Interior

Description:

Duct off front dehumidifier.

15. Location:

Interior

Description:

Emergency Exit - Left Side

Existing Condition Photographs (Continued)

16. Location:

Interior

Description:

Emergency Exit - Right side.

17. Location:

Exterior

Description:

Fenton W. Chester Street Sign.

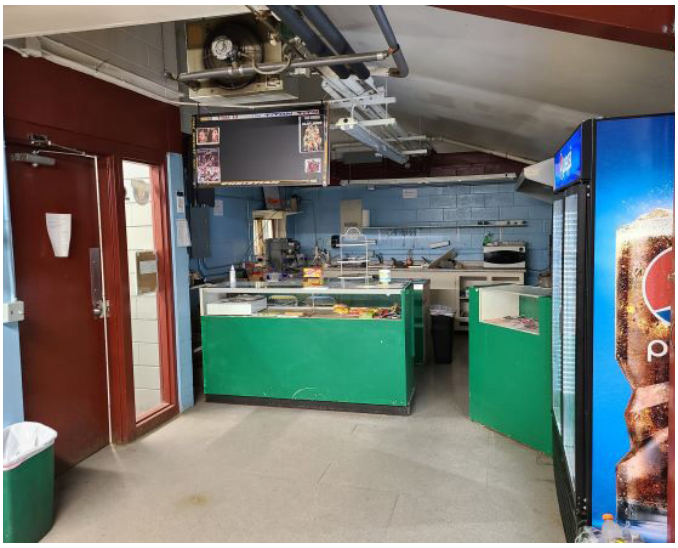
18. Location:

Interior

Description:

Food service cooking and hood area.

Existing Condition Photographs (Continued)



19. Location:

Interior

Description:

Food service counter.

20. Location:

Interior

Description:

Header trench - Grate cover

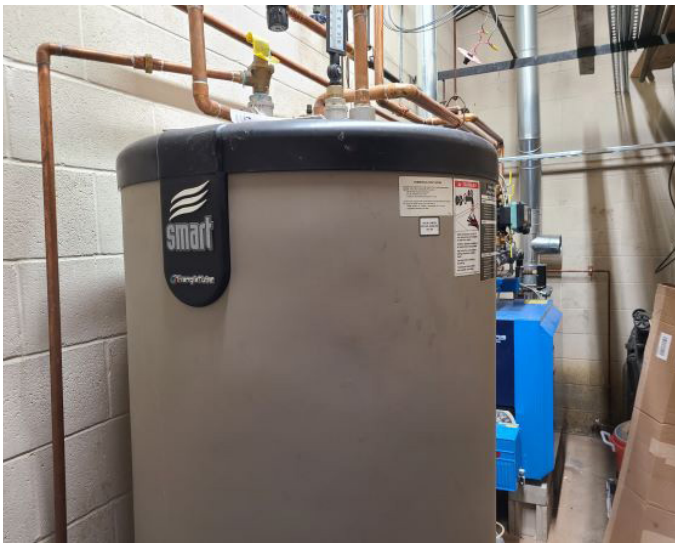
21. Location:

Interior

Description:

Header trench - Storage on planks.

Existing Condition Photographs (Continued)

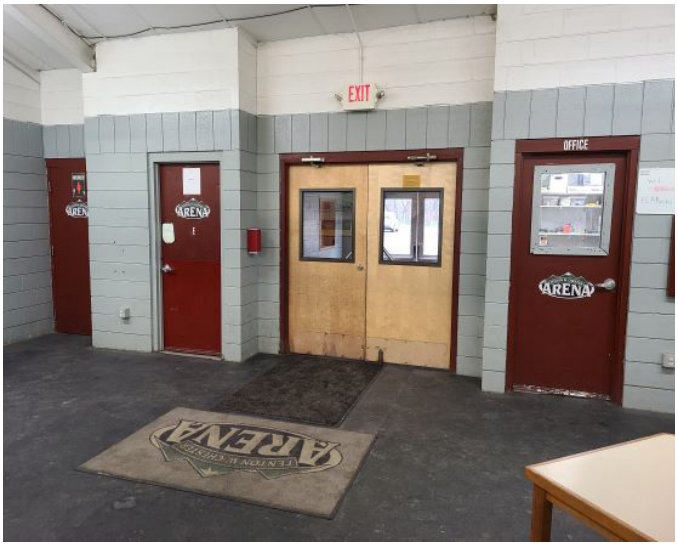


22. Location:

Interior

Description:

Hot water heater.

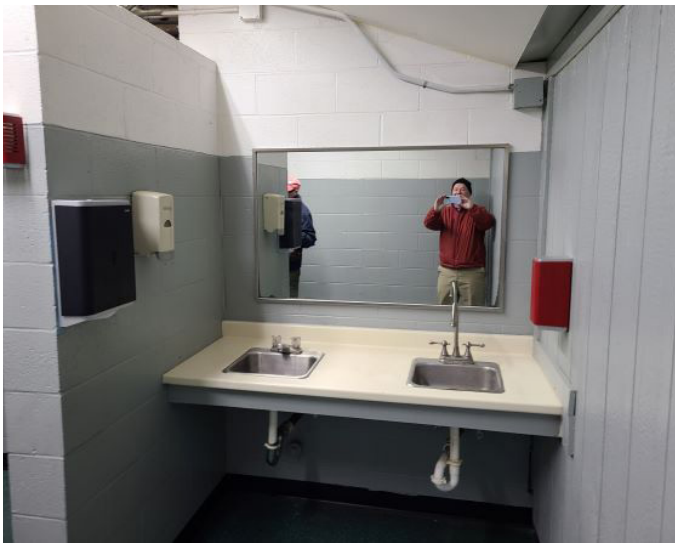


23. Location:

Interior

Description:

Interior side main entrance - exit.



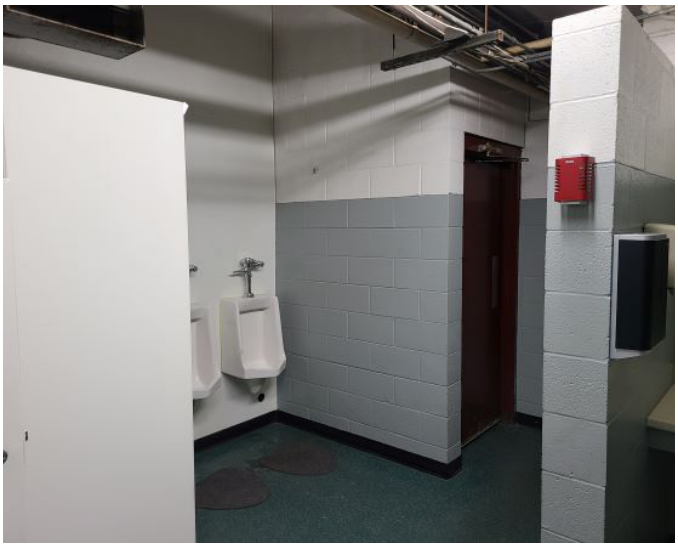
24. Location:

Interior

Description:

Mens bathroom sinks.

Existing Condition Photographs (Continued)



25. Location:

Interior

Description:

Mens Bathroom

26. Location:

Interior

Description:

Pro Shop

27. Location:

Interior

Description:

Raised video viewing booth.

Existing Condition Photographs (Continued)

28. Location:

Exterior

Description:

Resurfacer - exit door for dumps.

29. Location:

Interior

Description:

Resurfacer - Propane unit.

30. Location:

Interior

Description:

Skaters enjoying ice.

Existing Condition Photographs (Continued)

31. Location:

Interior

Description:

Team bench area - clearance issue.

32. Location:

Interior

Description:

Team bench area.

33. Location:

Interior

Description:

Time keepers area.

Existing Condition Photographs (Continued)

34. Location:

Interior

Description:

Trophy case.

35. Location:

Interior

Description:

Typical icing at spectator side of gate and dashers.

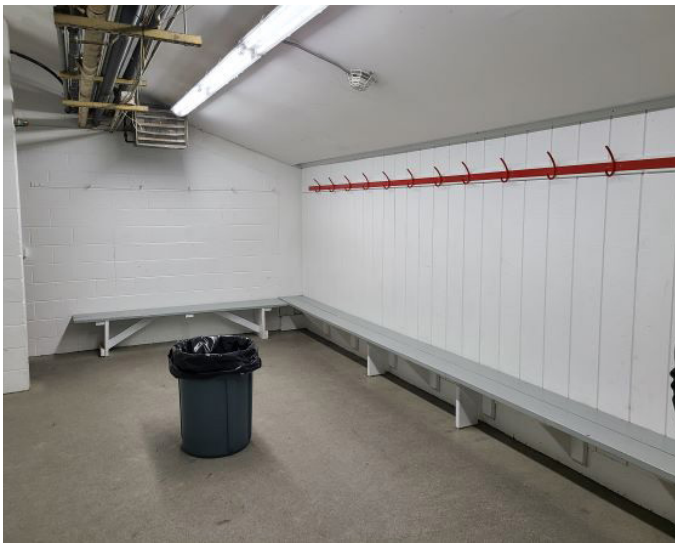
36. Location:

Interior

Description:

Typical space heater.

Existing Condition Photographs (Continued)

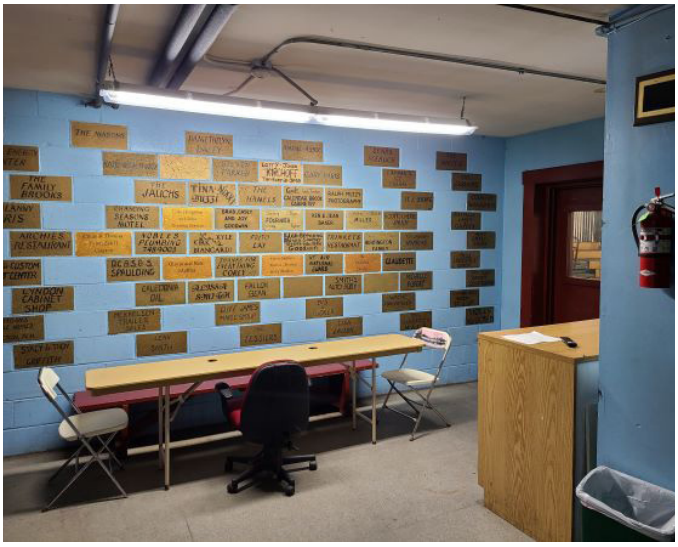


37. Location:

Interior

Description:

Typical team room 1 of 4



38. Location:

Interior

Description:

Warming/meeting/eating table.